STREPTOMYCIN DERMATITIS IN NURSES

BY

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Dermatitis affecting nurses who give streptomycin injections has been described in the United States (Strauss and Warring, 1947; Report to Council on Pharmacy and Chemistry, A.M.A., 1947; Rauchwerger *et al.*, 1948). Trials of streptomycin have been conducted at the Brompton Hospital under the Medical Research Council Scheme since January, 1947, but until the last few months we had seen no cases of hypersensitivity in streptomycin handlers. However, dermatitis due to this drug has recently been observed in four nurses. Since the trials began approximately 80 nurses have handled streptomycin for varying periods.

Duration of Contact.—Each of the four affected nurses gave six to 12 injections daily for periods varying from six weeks to six months. The contact was that involved in mixing the streptomycin powder in the ampoule with triple-distilled water, giving the injections, and later washing and cleaning the syringes. There was no previous history of allergy or skin infection in any of these nurses.

Clinical Findings

Oedema and irritation round the eyes occurred in all four cases. In three there was also a rash over the elbow flexures (Fig. 1). This rash was papular, erythematous, and itchy, with accompanying oedema and later vesicle formation. In the fourth case there was a similar rash on the fingers. All four nurses complained of irritation and watering of the eyes. In only one was there conjunctival injection; later a *Staphylococcus aureus* was grown from her conjunctival sac.

In three of the four nurses the skin round the eyes was first affected, while in the fourth the rash appeared on the fingers and involved the eye regions later. In two cases the face also became involved. In the three cases in which

on night duty during the period of exposure to streptomycin. However, in the only case in which the skin of the fingers was affected no rash appeared in the elbow regions, and in one case the rash appeared over both elbow flexures.

The nurse whose hands were involved was the most severe case. The skin over her fingers became swollen, dry, scaly, and itchy, and deep cracks formed along the creases on the flexor and extensor surfaces. Later her eyes and face became involved.

FIG. 2.—Skin test with 50 µg. of streptomycin hydrochloride in 0.1 ml. of normal saline. The streptomycin reaction is shown on the right. A control test with 0.1 ml. of normal saline is shown on the left.

Course.—Three of the nurses noticed that the skin condition improved while they were off duty on holiday or sick-leave and recurred as soon as contact with streptomycin was resumed. In one, the rash reappeared around her eye and elbow after the first day on duty after two weeks' holiday. We found little effect from local applications to the skin areas showing sensitization and poor response to the use of antihistamine drugs so long as contact with streptomycin continued.

In each case there was rapid improvement as soon as the contact with streptomycin was stopped, although the skin of the hands of the most severely affected nurse was not normal even after five weeks off duty.

Investigations

Skin tests were carried out on the four affected nurses by giving an intradermal injection of 50 µg. of streptomycin hydrochloride dissolved in 0.1 ml. of physiological saline, using saline alone as a control. No significant reaction was seen at 10 or 20 minutes after the injection. At 24 hours, three showed a weal of 15 mm. or more in diameter, with a surrounding flare 20 mm. or more in diameter (Fig. 2), and stated that they had first noticed the local reaction three to four hours after the injection; the fourth showed only a flare more than 20 mm. in diameter, and stated that she had first noticed it eleven hours after the injection.

In three of the four cases a general reaction, consisting of increased itching, with or without increase in the rash, occurred at about the same time as the local reaction developed. In the fourth case there was no increase in the itching or in the original rash, but, as the local reaction appeared, fresh reddish macules were noted around the wrists. These disappeared in a few hours, but reappeared when the skin reaction was repeated using 100 µg. of streptomycin.

Thirty nurses in prolonged contact but without symptoms of sensitivity were tested, using 100 µg. of streptomycin, and showed no significant reactions. In six patients treated with streptomycin but with no symptoms suggesting sensitivity to it we found the intradermal test negative before and after treatment.

White blood cell counts were carried out on all four cases. There was no eosinophilia or other abnormality.

FIG. 1.—Showing streptomycin dermatitis of the elbow flexures.

the rash started round the eyes the left eye was affected first and the skin over the right elbow flexure later. It is possible that the left hand was soiled with streptomycin during the mixing of the drug with distilled water, or in holding the patient's skin during the injection, and then used to rub the left eye, as is natural, and contaminated the right elbow region when the arms were crossed. Two of the nurses said they often sat with bare arms crossed while

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Discussion

Although none of the cases recorded by Rauchwerger *et al.* had had less than eight months' exposure to streptomycin before they developed skin lesions, Strauss and Warring recorded one case after only one month. In our own cases symptoms developed between six weeks and six months after the exposure to streptomycin began. The sites of the lesions have been much the same in all three series, though our cases are remarkable in that the hands or fingers were affected in only one of the four.

Rauchwerger and his colleagues considered that intradermal tests were more reliable than patch tests and were negative in those not exposed to streptomycin. We also had no positive reactions in the controls.

An exacerbation of the lesions during the skin reaction to the patch test occurred in three out of four of Strauss and Warring's cases and to the intradermal test in at least one of those recorded by Rauchwerger *et al.* A definite flare-up was seen in three of our four cases during the intradermal test, and the development of a rash on the wrist in the fourth case may have been a similar manifestation.

We consider that the occurrence of both local and general reactions in the four nurses on skin testing supports the clinical impression that their skin lesions were due to handling streptomycin.

Prevention.—Nurses and others should be warned to avoid soiling their skin with the powder or solution and instructed to wear rubber gloves when handling streptomycin. They should wash their gloves, hands, and arms thoroughly afterwards. It appears that, even if sensitized, a nurse can continue to work with streptomycin if these precautions are taken (Strauss and Warring, 1947). Skin-sensitivity tests should be done to confirm suspected streptomycin sensitivity and those proved sensitive warned to take full precautions and to inform the doctor of the sensitivity if streptomycin should ever be advised for them as patients.

Summary

Four nurses out of approximately 80 handling streptomycin at Brompton Hospital, London, during a period of 18 months, developed a dermatitis. Their exposure varied from six weeks to six months.

The dermatitis consisted of an itchy papular erythema of the skin round the eyes and over the elbow flexures. In only one nurse were the hands involved.

Skin-sensitivity tests, using 50 µg. of streptomycin in 0.1 ml. of saline, were positive in the four affected nurses but negative in controls.

People handling streptomycin should wear rubber gloves and avoid soiling their skin with the material.

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Specific recommendations for combating malaria on a world-wide scale were drawn up by the Expert Committee on Malaria of the World Health Organization, which met in Washington, D.C., on May 19–25. Its report outlines methods to implement the policy already advanced by the W.H.O. The Committee on Malaria was presided over by Dr. Arnaldo Gebaldon (Venezuela). Among the members who attended were Major-General Sir Gordon Covell (United Kingdom), Dr. Paul F. Russell (U.S.A.), Medical General Marcel Vaucel (France), and Dr. D. K. Viswanathan (India). Dr. Wallace R. Aykroyd officially represented the Food and Agriculture Organization on the committee, and Dr. Emilio Pampana, of the W.H.O., acted as secretary. Attending as observers for the Pan-American Malaria Commission were Dr. Carlos A. Alvarado (Argentina), Dr. Paulo C. A. Antunes (Brazil), and Dr. Luis Vargas (Mexico).

IDIOPATHIC HYPERSPLENISM

REPORT OF A CASE

BY

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Recent work has thrown more light on the functions of the spleen in regulating the levels of the three formed elements in the blood—red cells, white cells, and platelets.

The destructive action of the spleen on the white blood cells is stressed by Wiseman and Doan (1939), who described three cases of chronic neutropenia with oral ulceration associated with splenomegaly. Along with this neutropenia were variable purpura and thrombocytopenia. The bone-marrow, in contrast to the peripheral blood picture, showed a pronounced hyperplasia. Removal of the spleen resulted in a return of the white cell count to normal, and examination of the spleen by supravital methods showed excessive phagocytosis of neutrophils by clasmatocytes. These workers termed this condition chronic splenic neutropenia. Two further cases were described by them in 1942. Similar cases have since been recorded by others. Langston *et al.* (1945) found evidence of excessive phagocytosis in their case, and Muether *et al.* (1941), describing one case, found groups of degenerate white cells lying free in the splenic sinuses. Doan and Wright (1946) consider that a similar splenic effect on platelets is the cause of thrombocytopenic purpura.

A destructive action on the red cells has also been described. Doan and Wright (1946) described two cases of "splenic panhaematopenia" and charted the haematological findings in five others. Panmyeloid hyperplasia was a feature in these cases. Splenectomy resulted in a return of the blood picture to normal. These workers found diffuse endothelial hyperplasia in the splenic sinuses and evidence of excessive sequestration and destruction of red cells, white cells, and platelets in supravital sections of the spleen.

Doan (1945) and Doan and Wright (1946) believe that selective destruction by the spleen of red cells leads to congenital acholuric jaundice, of white cells to chronic splenic neutropenia, and of platelets to thrombocytopenic purpura. These blood elements may be involved singly or in combination.

Similar clinical pictures have been described by others, who, however, have failed to find evidence of excessive splenic destruction of the circulating blood elements. These others believe that the main factor is an inhibitory action of the spleen on the marrow. Singer, Dameshek, and Miller (1941), studying the effect of splenectomy on the blood picture in a variety of conditions, came to the conclusion that the spleen exerts some influence on haemopoiesis.

Rogers and Hall (1945) and Salzer *et al.* (1945), each describing one case of chronic neutropenia relieved by splenectomy, could find no evidence of excessive phagocytosis of granulocytes. Splenomegaly in various other unrelated conditions may also be accompanied by leucopenia. Engelbreth-Holm (1938), in his study of tuberculous splenomegaly, noted the association of anaemia and leucopenia with a hyperplastic marrow which returned to normal after splenectomy. Schousboe (1940) described similar findings in lymphogranulomatosis and syphilitic cirrhosis with splenomegaly and anaemia. These authors suggested a splenic control of the emission of cells from the marrow.

Dameshek and Miller (1946) studied the bone marrow in cases of idiopathic thrombocytopenic purpura before